technologists, registered nurses, and others who wish to change fields or specialize. Others interested in the nuclear medicine technology field have three options: A 2-year certificate program, a 2-year associate program, or a 4-year bachelor's program.

The Joint Review Committee on Education Programs in Nuclear Medicine Technology accredits most formal training programs in nuclear medicine technology. In 1999, there were 96 accredited programs.

All nuclear medicine technologists must meet the minimum Federal standards on the administration of radioactive drugs and the operation of radiation detection equipment. In addition, about half of all States require technologists to be licensed. Technologists also may obtain voluntary professional certification or registration. Registration or certification is available from the American Registry of Radiologic Technologists and from the Nuclear Medicine Technology Certification Board. Most employers prefer to hire certified or registered technologists.

Technologists may advance to supervisor, then to chief technologist, and to department administrator or director. Some technologists specialize in a clinical area such as nuclear cardiology or computer analysis or leave patient care to take positions in research laboratories. Some become instructors or directors in nuclear medicine technology programs, a step that usually requires a bachelor's degree or a master's in nuclear medicine technology. Others leave the occupation to work as sales or training representatives for medical equipment and radiopharmaceutical manufacturing firms, or as radiation safety officers in regulatory agencies or hospitals.

Job Outlook

Employment of nuclear medicine technologists is expected to grow about as fast as the average for all occupations through the year 2008. The number of openings each year will be very low because the occupation is small. Growth will arise from an increase in the number of middle-aged and older persons who are the primary users of diagnostic procedures, including nuclear medicine tests. Nonetheless, job seekers will face more competition for jobs than in the recent past. In an attempt to employ fewer technologists and lower labor costs, hospitals continue to merge nuclear medicine and radiologic technology departments. Consequently, opportunities will be best for technologists who can perform both nuclear medicine and radiologic procedures.

Technological innovations may increase the diagnostic uses of nuclear medicine. One example is the use of radiopharmaceuticals in combination with monoclonal antibodies to detect cancer at far earlier stages than is customary today, and without resorting to surgery. Another is the use of radionuclides to examine the heart's ability to pump blood. Wider use of nuclear medical imaging to observe metabolic and biochemical changes for neurology, cardiology, and oncology procedures, will also spur some demand for nuclear medicine technologists.

On the other hand, cost considerations will affect the speed with which new applications of nuclear medicine grow. Some promising nuclear medicine procedures, such as positron emission tomography, are extremely costly, and hospitals contemplating them will have to consider equipment costs, reimbursement policies, and the number of potential users.

Earnings

Median annual earnings of nuclear medicine technologists were $39,610 in 1998. The middle 50 percent earned between $34,910 and $46,570 a year. The lowest 10 percent earned less than $30,590 and the highest 10 percent earned more than $52,770 a year.

Related Occupations

Nuclear medical technologists operate sophisticated equipment to help physicians and other health practitioners diagnose and treat patients. Radiologic technologists, diagnostic medical sonographers, cardiovascular technologists, electroneurodiagnostic technologists, clinical laboratory technologists, perfusionists, radiation therapists, and respiratory therapists also perform similar functions.

Sources of Additional Information

Additional information on a career as a nuclear medicine technologist is available from:

☛ The Society of Nuclear Medicine-Technologist Section, 1850 Samuel Morse Dr., Reston, VA 22090.

For information on a career as a nuclear medicine technologist, enclose a stamped, self-addressed business size envelope with your request to:

☛ American Society of Radiologic Technologists, Customer Service Department, 15000 Central Ave. SE., Albuquerque, NM 87123-3917, or call (800) 444-2778.

For a list of accredited programs in nuclear medicine technology, write to:

☛ Joint Review Committee on Educational Programs in Nuclear Medicine Technology, PMB 418, 1 2nd Avenue East, Suite C, Polson, MT 59860-2107.

Information on certification is available from:

☛ Nuclear Medicine Technology Certification Board, 2970 Clairmont Rd., Suite 610, Atlanta, GA 30329.

Opticians, Dispensing

(O*NET 32514)

Significant Points

- Although training requirements vary by State, most dispensing opticians receive training on-the-job or through apprenticeships lasting 2 to 4 years.
- Employment of dispensing opticians is expected to increase as fast as the average for all occupations through 2008 as demand grows for corrective lenses.

Nature of Work

Dispensing opticians fit eyeglasses and contact lenses, following prescriptions written by ophthalmologists or optometrists. (The work of optometrists is described in a statement elsewhere in the *Handbook*. See the statement on physicians for information about ophthalmologists.)

Dispensing opticians examine written prescriptions to determine lens specifications. They recommend eyeglass frames, lenses, and lens coatings after considering the prescription and the customer's occupation, habits, and facial features. Dispensing opticians measure clients' eyes, including the distance between the centers of the pupils and the distance between the eye surface and the lens. For customers without prescriptions, dispensing opticians may use a lensometer to record the present eyeglass prescription. They also may obtain a customer's previous record, or verify a prescription with the examining optometrist or ophthalmologist.

Dispensing opticians prepare work orders that give ophthalmic laboratory technicians information needed to grind and insert lenses into a frame. The work order includes lens prescriptions and information on lens size, material, color, and style. Some dispensing opticians grind and insert lenses themselves. After the glasses are made, dispensing opticians verify that the lenses have been ground to specifications. Then they may reshape or bend the frame, by hand or using pliers, so that the eyeglasses fit the customer properly and comfortably. Some also fix, adjust, and refit broken frames. They instruct clients about adapting to, wearing, or caring for eyeglasses.

Some dispensing opticians specialize in fitting contacts, artificial eyes, or cosmetic shells to cover blemished eyes. To fit contact

Dispensing opticians ensure that contacts fit properly and show customers how to insert, remove, and care for them.

lenses, dispensing opticians measure eye shape and size, select the type of contact lens material, and prepare work orders specifying the prescription and lens size. Fitting contact lenses requires considerable skill, care, and patience. Dispensing opticians observe customers' eyes, corneas, lids, and contact lenses with special instruments and microscopes. During several visits, opticians show customers how to insert, remove, and care for their contacts, and ensure the fit is correct.

Dispensing opticians keep records on customer prescriptions, work orders, and payments; track inventory and sales; and perform other administrative duties.

Working Conditions

Dispensing opticians work indoors in attractive, well-lighted, and well-ventilated surroundings. They may work in medical offices or small stores where customers are served one at a time, or in large stores where several dispensing opticians serve a number of customers at once. Opticians spend a lot of time on their feet. If they prepare lenses, they need to take precautions against the hazards associated with glass cutting, chemicals, and machinery.

Most dispensing opticians work a 40-hour week, although some work longer hours. Those in retail stores may work evenings and weekends. Some work part time.

Employment

Dispensing opticians held about 71,000 jobs in 1998. About 50 percent worked for ophthalmologists or optometrists who sell glasses directly to patients. Many also work in retail optical stores that offer one-stop shopping. Customers may have their eyes examined, choose frames, and have glasses made on the spot. Some work in optical departments of drug and department stores.

Training, Other Qualifications, and Advancement

Employers usually hire individuals with no background in opticianry or those who have worked as ophthalmic laboratory technicians and then provide the required training. (See the statement on ophthalmic laboratory technicians elsewhere in the *Handbook*.) Training may be informal, on-the-job or formal apprenticeship. Some employers, however, seek people with postsecondary training in opticianry.

Knowledge of physics, basic anatomy, algebra, geometry, and mechanical drawing is particularly valuable because training usually includes instruction in optical mathematics, optical physics, and the use of precision measuring instruments and other machinery and tools. Dispensing opticians deal directly with the public so they should be tactful, pleasant, and communicate well. Manual dexterity and the ability to do precision work are essential.

Large employers usually offer structured apprenticeship programs, and small employers provide more informal on-the-job training. In the 21 States that offer a license to dispensing opticians, individuals without postsecondary training work from 2 to 4 years as apprentices. Apprenticeship or formal training is offered in most States as well.

Apprentices receive technical training and learn office management and sales. Under the supervision of an experienced optician, optometrist, or ophthalmologist, apprentices work directly with patients, fitting eyeglasses and contact lenses. In the 21 States requiring licensure, information about apprenticeships and licensing procedures is available from the State board of occupational licensing.

Formal opticianry training is offered in community colleges and a few colleges and universities. In 1999, there were 25 programs accredited by the Commission on Opticianry Accreditation that awarded 2-year associate degrees in ophthalmic dispensing or optometric technology. There are also shorter programs of one year or less. Some States that offer a license to dispensing opticians allow graduates to take the licensure exam immediately upon graduation; others require a few months to a year of experience.

Dispensing opticians may apply to the American Board of Opticianry and the National Contact Lens Examiners for certification of their skills. Certification must be renewed every 3 years through continuing education.

Many experienced dispensing opticians open their own optical stores. Others become managers of optical stores or sales representatives for wholesalers or manufacturers of eyeglasses or lenses.

Job Outlook

Employment in this occupation is expected to increase as fast as the average for all occupations through 2008 as demand grows for corrective lenses. The number of middle-aged and elderly persons is projected to increase rapidly. Middle age is a time when many individuals use corrective lenses for the first time, and elderly persons require more vision care, on the whole, than others.

Fashion, too, influences demand. Frames come in a growing variety of styles and colors—encouraging people to buy more than one pair. Demand is also expected to grow in response to the availability of new technologies that improve the quality and look of corrective lenses, such as anti-reflective coatings and bifocal lenses without the line visible in old-style bifocals. Improvements in bifocal, extended wear, and disposable contact lenses will also spur demand.

The need to replace those who leave the occupation will result in job openings. Nevertheless, the total number of job openings will be relatively small because the occupation is small. This occupation is vulnerable to changes in the business cycle because eyewear purchases can often be deferred for a time. Employment of opticians can fall somewhat during economic downturns.

Earnings

Median annual earnings of dispensing opticians were $22,440 in 1998. The middle 50 percent earned between $17,680 and $28,560 a year. The lowest 10 percent earned less than $14,240 and the highest 10 percent earned more than $37,080 a year. Median annual earnings in the industries employing the largest number of dispensing opticians in 1997 were as follows:

Offices and clinics of medical doctors	$25,900
Retail stores, not elsewhere classified	21,500
Offices of other health care practitioners	20,100

Related Occupations

Other workers who deal with customers and perform delicate work include jewelers, locksmiths, ophthalmic laboratory technicians,

orthodontic technicians, dental laboratory technicians, prosthetics technicians, camera repairers, and watch repairers.

Sources of Additional Information

For general information about a career as a dispensing optician, contact:

☛ Opticians Association of America, 10341 Democracy Lane, Fairfax, VA 22030-2521. Internet: **http://www.opticians.org**

For general information about a career as a dispensing optician and a list of accredited training programs, contact:

☛ Commission on Opticianry Accreditation, 10341 Democracy Lane, Fairfax, VA 22030-2521. Internet: **http://www.coaccreditation.com**

For general information on opticianry and a list of home-study programs, seminars, and review materials, contact:

☛ National Academy of Opticianry, 8401 Corporate Drive, Suite 605, Landover, MD 20785. Internet: **http://www.nao.org**

Pharmacy Technicians and Assistants

(O*NET 32518)

Significant Points

- Opportunities for pharmacy technicians and assistants are expected to be good, especially for those with formal training or previous work experience.
- Many technicians and assistants work evenings, weekends, and some holidays.
- Seven out of 10 jobs were in retail pharmacies, either independently owned or part of a drug store chain, grocery store, department store, or mass merchandiser.

Nature of the Work

Pharmacy technicians and assistants help licensed pharmacists provide medication and other health care products to patients. *Pharmacy technicians* usually perform more complex tasks than assistants do, although in some States their duties and job titles overlap. Technicians usually perform routine tasks to help prepare prescribed medication for patients, such as counting and labeling. A pharmacist must check every prescription before it can be given to a patient. Technicians refer any questions regarding prescriptions, drug information, or health matters to a pharmacist (see the statement on pharmacists, located elsewhere in the *Handbook*). *Pharmacy assistants* usually have fewer, less complex responsibilities than technicians. Assistants are often clerks or cashiers who primarily answer telephones, handle money, stock shelves, and perform other clerical duties.

Pharmacy technicians who work in retail pharmacies have varying responsibilities depending on State rules and regulations. Technicians receive written prescriptions or requests for a prescription refill from patients or representatives. They must verify that the information on the prescription is complete and accurate. To prepare the prescription the technician must retrieve, count, pour, weigh, measure, and sometimes mix the medication. Then, they prepare the prescription labels, select the type of prescription container, and affix the prescription and auxiliary labels to the container. Once the prescription is filled, technicians price and file the prescription, which must be checked by a pharmacist before it is given to a patient. Technicians may establish and maintain patient profiles, prepare insurance claim forms, and stock and take inventory of prescription and over-the-counter medications. Some also clean the pharmacy equipment, help with the maintenance of equipment and supplies, and manage the cash register.

In hospitals, technicians have added responsibilities. They read patient charts and prepare and deliver the medicine to patients. The pharmacist must check the order before it is delivered to the patient. The technician then copies the information about the prescribed medication onto the patient's profile. Technicians may also assemble a 24-hour supply of medicine for every patient. They package and label each dose separately. The package is then placed in the medicine cabinet of each patient, until the supervising pharmacist checks it. It is then given to the patient. Technicians are responsible for keeping a running inventory of medicines, chemicals, and other supplies used.

Working Conditions

Pharmacy technicians and assistants work in clean, organized, well-lighted, and well-ventilated areas. Most of their workday is spent on their feet. They may be required to lift heavy boxes or to use stepladders to retrieve supplies from high shelves.

Technicians and assistants work the same hours as pharmacists. This includes evenings, nights, weekends, and some holidays. Most technicians work 35-45 hours a week. Since some hospital and retail pharmacies are open 24 hours a day, technicians and assistants may work varying shifts. There are many opportunities for part-time work in both retail and hospital settings.

Employment

Pharmacy technicians and assistants held about 170,000 jobs in 1998. Seven out of 10 jobs were in retail pharmacies, either independently owned or part of a drug store chain, grocery store, department store, or mass merchandiser. Two out of 10 jobs were in hospitals and a small number were in mail-order pharmacies, clinics, pharmaceutical wholesalers, and the Federal Government.

A pharmacy technician establishes and maintains patient profiles.